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(54) Volume-batching implement for powder products, grains or beans such as flour, rice or coffee

(57) The volume-batching implement for products in powder, grains or beans such as flour, rice or coffee consists of a container (1) provided at the inside with two superposed discs (4, 5) having offset openings, between which a series of radial blades (7) of a shaft (8) always rotating in the same way, define an equal number of measuring chambers in such a way that a measuring chamber is always located at a discharging position and at least one measuring chamber is located in a charging position; the bladed shaft (8) can be provided at its upper part with mixing blades (12) so that the product stored in the container (1) may be kept moving.

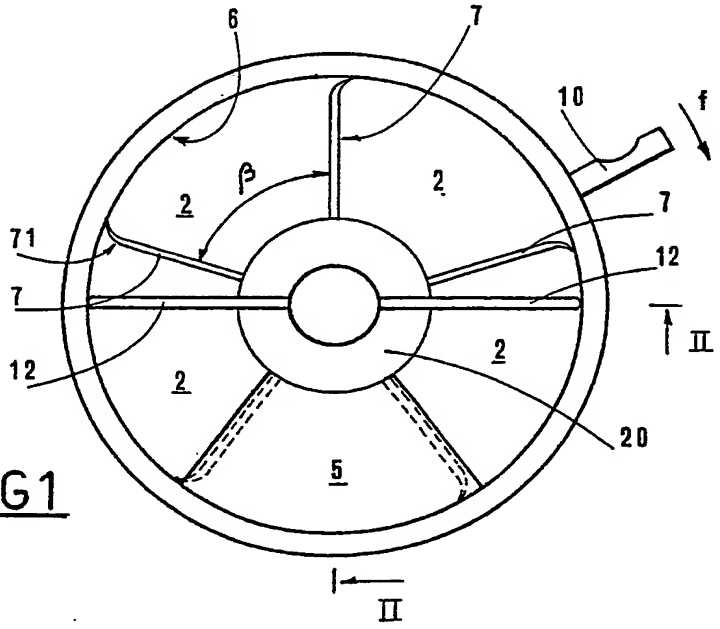

FIG1

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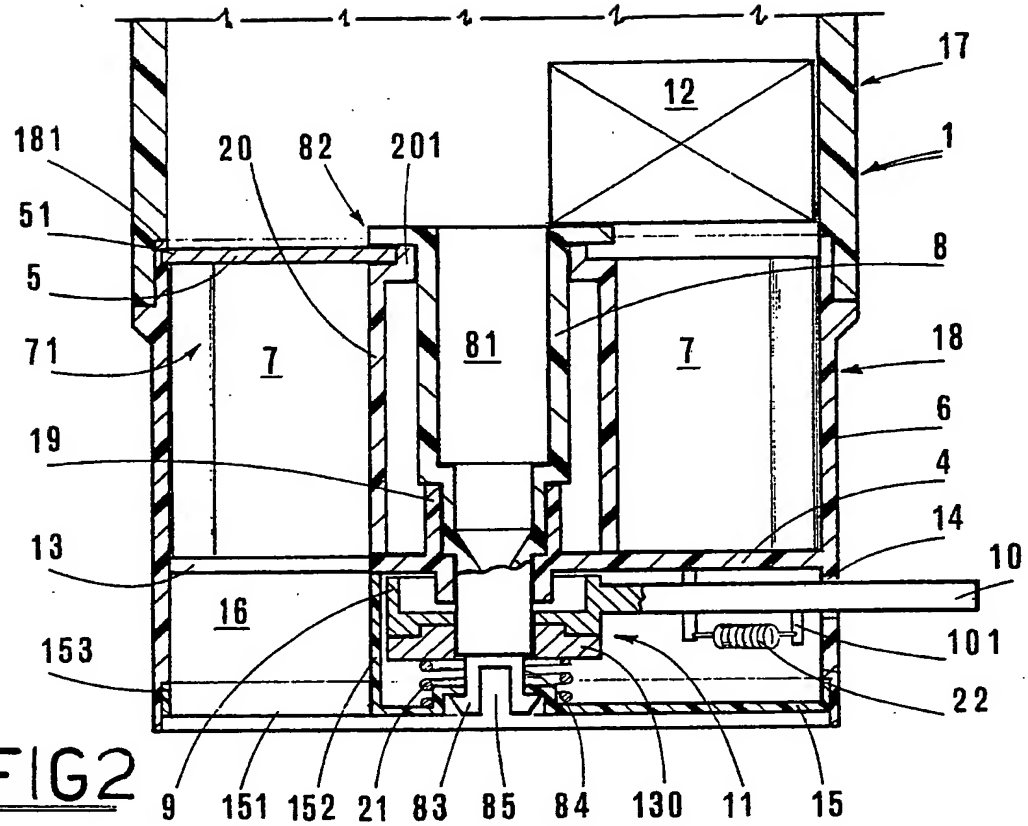

FIG2

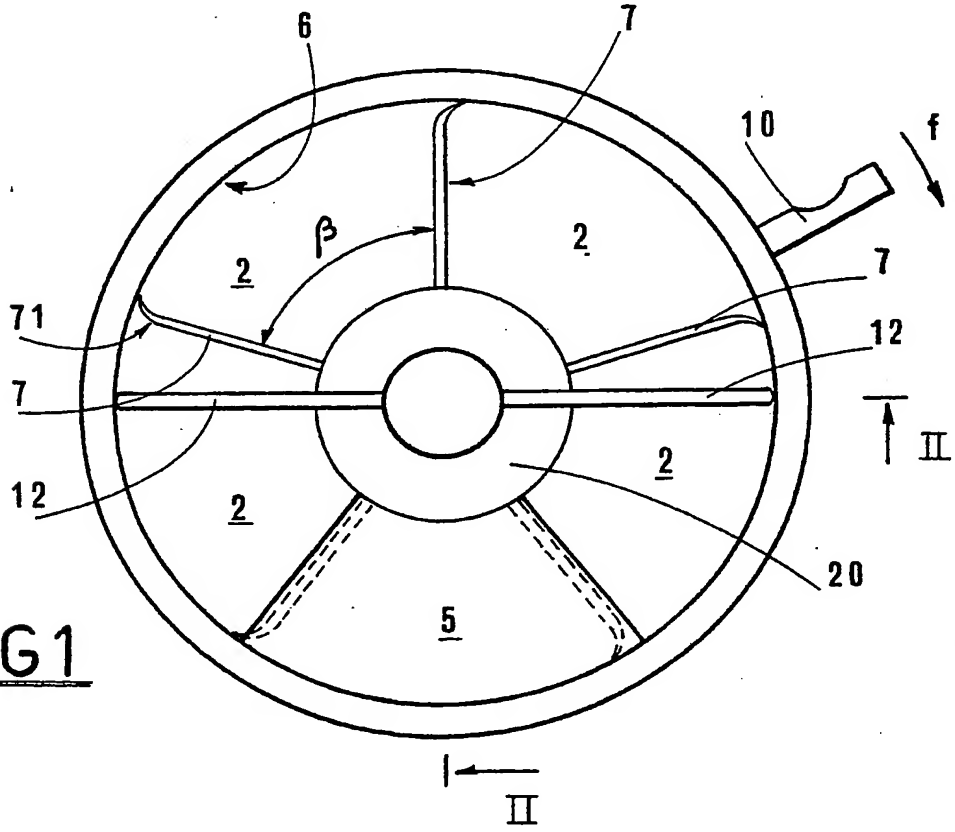

FIG1

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FIG 4

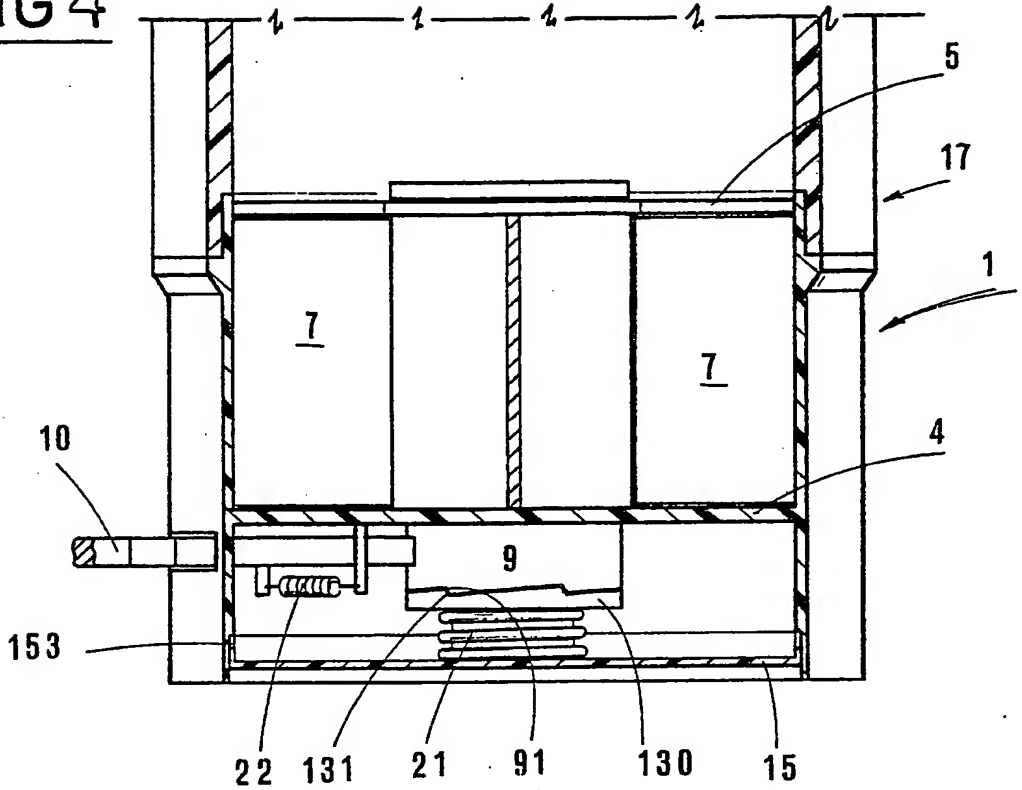
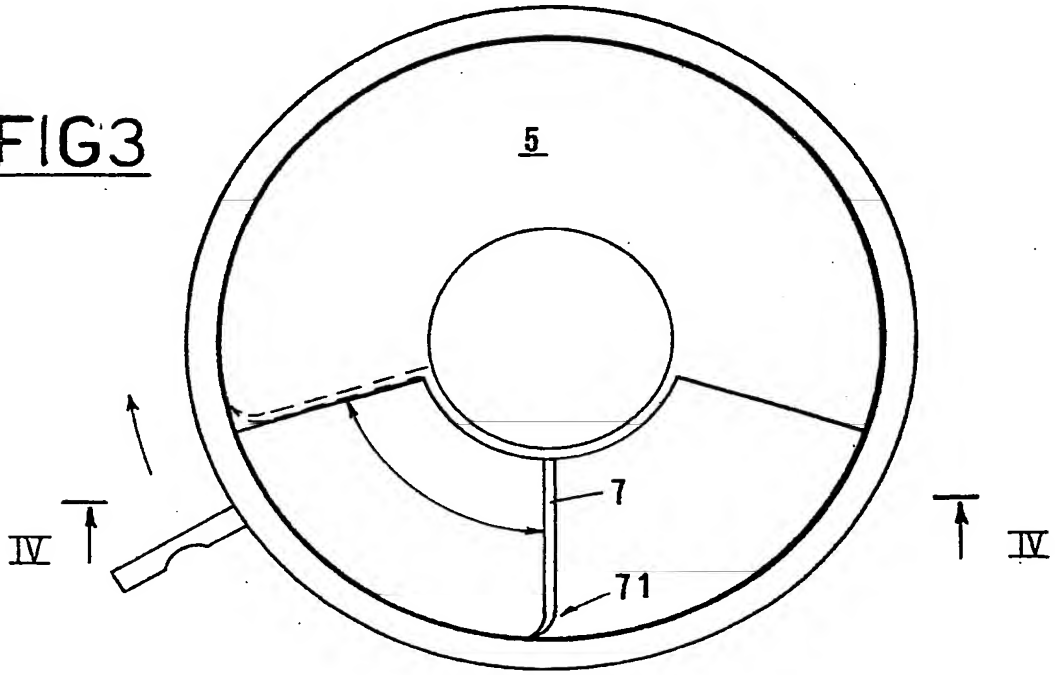


FIG3



SPECIFICATION

Volume-batching implement for products in powder, grains or beans, such as flour, rice or coffee

The present invention relates to a volume-batching implement for products in powder, grains or beans, such as flour, rice or coffee.

Different types of volume-batching implements are currently on the market for measuring out products in the form of powders, grains or beans such as for example flour and sugar or rice and coffee.

One of these batching implements consists of a distribution drawer horizontally movable from a position in which the product is withdrawn from a container to a position in which the measured out product is discharged outside the container itself.

Another batching implement consists of a body closed by a lid provided with a housing constituting the volume of the product to be measured out. When said housing has to be filled, it is necessary to overturn the container then to rotate a sector closing the housing on the side thereof facing the inside of the container and finally to make the container stand again with its housing containing the measured out amount of product.

In a further batching implement a measuring chamber is provided to be located at the bottom of the container and to be closed at its upper and lower ends by simultaneously-rotatable discs, each disc being provided with an opening which is offset with respect to that of the other disc. Therefore in this batching implement the measuring chamber is either open towards the container for receiving said measured out amount of product or open downwardly for discharging said amount.

The batching implement provided with a distribution drawer is simple in construction but has a drawback: it allows a restricted batching volume so that it is practically useless when determined volumes are concerned.

The other types of batching implements allow to obtain bigger batching volumes though they have a reduced bulkiness but, as well as the above mentioned implements, they have the disadvantage that, if the product is pulverulent and tends to amalgamate, after a certain number of measured out amounts it is necessary to shake the container so that the product may go down into the measuring chamber.

A further drawback in these types of batching implements resides in that the time elapsed between a batching and the next one is not always sufficient to allow the measuring chamber to be charged again.

The object of the present invention is therefore to eliminate the above mentioned drawbacks and the invention as defined in the appended claims solves the problem of providing a batching implement more functional than those hereinbefore described and adapted to deliver the predetermined batching volume each time.

One of the advantages of the present invention essentially consists in that, even in the event of use at high speeds, the volume of the delivered product is strictly the same, owing to the fact that at least a measuring chamber is continuously open towards the container so that also the time necessary for carrying out one batching is used for filling the other measuring chambers.

A further advantage of the present invention resides in that it is adapted to batch powdered products tending to amalgamate without any problems, by virtue of the presence of mixing blades which after each use of the batching implement move the product contained therein.

A still further advantage consists in the possibility of avoiding the formation of incrustations along the container walls at least in the batching area due to the fact that the batching blades have the function of scrapers by virtue of their bent ends in contact with the inner wall of the container.

Yet another advantage of the present invention is the possibility of measuring out also materials in grains or in beans because the latter do not hinder the good operation of the batching implement due to the fact that the distance between the blades and an upper disc is slightly greater than the average size of the product.

The invention is described in greater detail hereinafter with the aid of the accompanying drawings showing an embodiment thereof.

Figure 1 is a plan view of a batching implement according to the present invention for powdered products.

Figure 2 is a cross-sectional view taken along line II–II in Figure 1.

Figure 3 is a plan view of a batching implement according to the present invention for products in grains or beans.

Figure 4 is a cross-sectional view taken along line IV–IV in Figure 3.

Referring to Figure 2, the batching implement for products in powder, grains or beans looks like a container 1 inside which two superposed horizontal discs 4 and 5 are provided which are spaced apart by two vertical small walls 7 laterally defining a measuring chamber 2. Each disc 4 and 5 is provided with an opening vertically offset with respect to the opening of the other disc.

According to the present invention, the small walls 7 are two of a series of at least two radial blades of a shaft 8 coaxial with the container 1 which advantageously consists of coaxial lower 18 and upper 17 portions engaged with each other. Since in this batching implement the small walls 7 are movable, the openings of the upper 5 and lower 4 discs respectively define the charging and discharging positions respectively of the measuring chambers 2.

The number of blades 7 and the distance between the upper 5 and lower 4 discs depend upon the volume of the product batch to be delivered.

The lower portion 18 made of stronger material than the upper one for reasons that will become apparent in the following has, at its lower part, a diaphragm constituting the lower disc 4 with its respective opening identified by 13 in Figure 2, said diaphragm in the batching implement in question also forming the container bottom.

Bottom 4 is provided, coaxially with the side wall 6 of the container 1 lower portion, with a hub 19

supporting the shaft 8 which, see Figure 2, has a top-open lightening blind hole 81. The opening 13 in bottom 4 is in the form of a sector of an annular rim having the same width as the angle formed by two adjacent blades 7.

Blades 7 (five in Figure 1) are applied to the shaft 8 by means of a tube 20 fitted on the same and engaged therewith by means not shown. Tube 20 is fitted on shaft 8 by virtue of its own narrowing 201 and its outer diameter is identical with the inner one of the opening 13 of bottom 4, for a reason to be clarified later.

The upper disc is provided with an axial hole and is fitted on shaft 8 between its upper end head 82 and tube 20; it has a reference tooth 51 located at its periphery. This tooth is introduced into a corresponding housing 181 in the lower portion 18 of the container 1, so that the upper disc 5 is obliged to keep a position in which it covers the opening 13 of bottom 4. Also the opening (without reference numeral) of the upper disc 5 is in the form of a sector of an annular rim.

An end hub 9 of a control lever 10, a unidirectional movement transmitting device 11 and a closing disc 15 are fitted on the lower end 83 of shaft 8, starting from hub 19 of bottom 4.

The control lever 10 extends beyond the lower portion 18 of the container 1 through an elongated horizontal opening 14. The length of the elongated opening 14 is such that it enables the control lever 10 to rotate in one way (consistent with arrow f in Figures 1 and 3) or in the other, through an angle slightly wider than angle β formed by two adjacent blades. The position of the elongated opening 14 is such that, while two blades 7 are vertically aligned with the radial sides of opening 13 in bottom 4, the control lever 10 occupies one of its two end positions.

To a lower lug 101 of the control lever 10 is fastened one end of a spring 22 fixed at its other end to the lower portion 18 of container 1 and adapted to rotate the control lever 10 in a way opposite that of arrow f. The unidirection movement transmitting device 11 consists of (see Figures 2 and 4) a keyed ring 13 and of a spring 21 fitted on the end 83 of shaft 8. The end hub 9 and ring 13 (Figure 4) are provided with front and sawtooth-shaped teeth 91 and 131 respectively, meshing with each other. The number of teeth 91 and 131 of the end hub 9 and of ring 13 is equal to the number of blades 7. The ring 13 can anyway slide axially along the shaft 8 urged by spring 21 acting on the closing disc 15 and adapted to keep teeth 91 and 131 of the hub end 9 and ring 13 respectively in meshing relation with respect to each other.

The closing disc 15 has its perimeter edge bent up and inserted by pressure into the inner surface of the container lower portion 18. In order to avoid the closing disc 15 getting off the shaft 8 due to the thrust of spring 21, the diameter of the axial hole in the closing disc 15 is smaller than the diameter of the end 83 of shaft 8, said end being provided with a perimeter housing 84 and a diametral cut 85 that makes it elastic so that the closing disc 15 can be applied thereto.

The closing disc 15 exhibits an opening 151 similar to opening 13 in bottom 4 and, tangentially to this opening 151, a small vertical wall 152 forming a discharge channel 16 for the container 1.

Removable closing lids (not shown) are also applied to the opposite ends of container 1.

In the batching implement according to the present invention for powdered products such as flour and sugar, shaft 8 (see Figures 1 and 2) is provided with mixing blades 12 located higher than its end head 82 and the upper disc 5 (see Figure 1) is a sector of slightly greater width than angle β formed by two adjacent blades 7.

The mixing blades 12 are disposed at different heights and they allow almost the whole product present in container 1 to be kept in movement during the use of the batching implement in question, so that the risks of amalgamation of the product are remarkably reduced.

In addition, the ends 71 of blades 7 which are close to said wall 6 of the container lower portion 18 are bent in a way consistent with the direction of rotation of said blades and are constantly in contact with said wall acting as a scraper for removing the product that may adhere against said side wall 6 of the container lower portion 18 when said batching implement is not used.

The upper disc or sector 5 is shaped, close to the side wall 6, in the same manner as ends 71 of blades 7 so that when the control lever 10 is in one of its end positions, the measuring chamber 2 defined by blades 7 vertically aligned with the opening 13 in bottom 4, is completely closed towards the container 1.

In the batching implement according to the present invention for products in grains or beans such as rice or coffee, blades 7 (see Figure 4) are spaced apart from the upper disc 5 a greater amount than the average size of the product to be measured out and the opening of the upper disc 5 (see Figure 3) is as wide as twice the angle β formed by two adjacent blades 7.

Owing to the distance existing between blades 7 and upper disc 5 the possible presence of grains or beans in this region does not prevent the shaft 8 from going on rotating.

In such a batching implement, after removing the lower cover it is sufficient to rotate the control lever 10 in the direction of arrow f against the action of spring 22 and to release it. During the rotation of the control lever 10, also the rotation of blades 7 and of the measuring chambers 2 laterally defined by the latter takes place so that the measuring chamber 2 next to the one in a discharging position and already empty reaches the discharging position. Simultaneously, another measuring chamber 2 reaches the charging position and begins to be filled. When the control lever 10 is in its foremost position, a previously filled measuring chamber 2 has completely reached a discharge position and an empty one has instead reached a charge position. Afterwards the spring 22 brings the control lever 10 back to its rearmost position without however rotating the shaft 8 because the teeth 131 of ring 13 are in meshing relation with teeth 91 of the end hub 9 of the control lever 10 along their inclined portion. Spring 21 allows the ring 13 to slide axially with respect to the shaft 8 while the control lever 10 moves back, and brings it back to the meshing position when the control lever 10 has

reached its rearmost position.

CLAIMS

1. A volume-batching implement for products in powder, grains or beans such as flour, rice or coffee, of the type consisting of a container inside which the delivering-measuring out members are disposed, characterized in that said delivering-measuring out members comprise: two horizontal fixed discs, each of them exhibiting an opening vertically offset in relation to the opening in the other disc, and at least two radial blades of a shaft coaxial with said container and rotating in one way only, said blades disposed between said discs defining an equal number of measuring chambers that are brought in succession to a discharging position vertically aligned with said opening in the lower disc also acting as a bottom for the container while at least another chamber is brought to a filling position vertically aligned with the opening in said upper disc.

2. A batching implement according to claim 1, characterized in that it comprises at least three of said blades and in that at least two of said measuring chambers are continuously disposed in vertical alignment with said opening in the upper disc and in communication with said upper container.

3. A batching implement according to claim 2, for measuring out powdered products such as flour, characterized in that mixing blades are associated with said bladed shaft which are located at different levels and are movable above said upper disc which consists of a sector slightly larger than the angle formed by two adjacent ones of said blades and is vertically aligned with said opening in said lower disc or bottom.

4. A batching implement according to claim 3, characterized in that said blades of the bladed shaft defining said measuring chambers have their ends close to the side wall of said hopper or container slightly bent in conformity with the direction of rotation of said bladed shaft, said bent ends of said blades being in contact with said side wall of the hopper so that they act as scrapers.

5. A batching implement according to claim 2, for measuring out products in grains or beans such as rice or coffee, characterized in that the width of said upper disc is such that it allows to leave two at the most of said measuring chambers uncovered and in that said disc is located higher than said blades by an amount slightly greater than the average size of the product in grans or beans.

6. A batching implement according to claim 2, characterized in that an end hub of a control lever is fitted on the lower end of said shaft extending beyond said lower disc or bottom of said container, said control lever, designed for controlling the unidirectional rotation of the bladed shaft itself through a unidirectional movement transmitting device, projecting from said hopper through a corresponding horizontal elongated opening provided thereon and defining the end positions reached by said control lever during its movement.

7. A batching implement according to claim 6, characterized in that said unidirectional movement trasmitting device is comprised of a keyed ring axially slidable on the lower end of said bladed shaft and provided with front toothsaw-shaped teeth in meshing relation with corresponding front teeth provided on said end hub of the control lever, said front teeth of said ring and end hub of the control lever being equal in number to said blades.

8. A batching implement according to claim 7, characterized in that said container is closed at its lower part by a closing disc engageable with the lower end of said bladed shaft and provided with a discharge opening vertically aligned with the opening in the bottom of said container, said closing disc also exhibiting, tangentially to its discharge opening, a small wall lightly touching said bottom of the container at its lower part and forming a discharge channel in said container.

9. A batching implement according to claim 1, characterized in that said container consists of two cylindrical portions, an upper one acting as a reservoir-hopper for the product to be measured out, and a lower one carrying said discs.

10. A batching implement according to claim 1, characterized in that said blades are fastened to a tube fitted on said shaft.

11. A batching implement according to the preceding claims and substantially as hereinbefore described and illustrated with reference to the accompanying drawings and for the intended purposes.

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